

WHAT IS CLAIMED IS:

1. An air conditioner for air-conditioning a compartment of a vehicle comprising:

a heat exchanging unit for performing heat exchange between air to be blown into the compartment and a fluid that flows inside the heat exchanging unit;

a plurality of wall outlet portions provided on walls of the compartment for allowing the air passed through the heat exchanging unit to exude into the compartment; and

a plurality of control means for controlling at least one of temperature and volume of the air flowing through the wall outlet portions independently.

2. The air conditioner according to claim 1, wherein the heat exchanging unit includes a cooling heat exchanger for cooling air and a heating heat exchanger for heating air.

3. The air conditioner according to claim 2, wherein each of the control means includes an air mix door that controls the volume of air cooled by the cooling heat exchanger and the volume of air heated by the heating heat exchanger.

4. The air conditioner according to claim 1, wherein the wall of the compartment has a surface member having air permeability, and the wall outlet portions are provided by the surface member.

5. The air conditioner according to claim 1, wherein the wall

is included in at least one of an instrument panel, a door trim, a ceiling, a portion above a meter, and a portion under the meter of the vehicle.

6. The air conditioner according to claim 1, wherein the volume of air flowing through at least one of the wall outlet portions is changed at predetermined intervals.

7. The air conditioner according to claim 1, wherein temperature of the walls is detected at plural positions, and the control means is controlled so that the temperature of the position where a heat load is high approximates to the temperature of the position where a heat load is low.

8. The air conditioner according to claim 1, further comprising:  
a counter flow restricting means for restricting the air in the compartment from flowing back, wherein the counter flow restricting means is provided proximate to at least one of the wall outlet portions.

9. An air conditioner for air-conditioning a compartment of a vehicle, comprising:

a heat exchanger for performing heat exchange between a fluid flowing therein and air to be blown into the compartment;

a duct through which the air passed through the heat exchanger flows;

a plurality of wall outlet portions through which the air in

the duct flows into the compartment, wherein the wall outlet portions are provided on a wall of the compartment;

a control means for controlling at least one of temperature and volume of the air; and

counter flow restricting means provided proximate to the wall outlet portions for restricting the air in the compartment from flowing back into the duct.

10. An air conditioner for air-conditioning a compartment of a vehicle, the air conditioner comprising:

an interior wall of the compartment forming a plurality of wall outlets through which air is blown into the compartment, wherein the wall outlets includes an instrument panel outlet, a ceiling outlet, a front right seat outlet, a rear right seat outlet, a front left seat outlet, a rear left seat outlet, a front right seat door trim outlet, a rear right seat door trim outlet, a front left seat door trim outlet, and a rear left seat door trim outlet; and

an air conditioner unit including

a cooling heat exchanger for cooling air,

a heating heat exchanger for heating air,

a case that houses the cooling heat exchanger and the heating heat exchanger therein, wherein the case is disposed such that its inside is separated into a first part and a second part, and the case forms

an instrument panel opening communicating with the instrument panel outlet and the ceiling outlet through an instrument panel duct,

a front right seat opening communicating with the front right seat outlet through a duct,

a rear right seat opening communicating with the rear right seat outlet through a duct,

a front left seat opening communicating with the front left seat outlet through a duct,

a rear left seat opening communicating with the rear left seat outlet through a duct,

a front right seat door trim opening communicating with the front right seat door trim outlet through a duct,

a rear right seat door trim opening communicating with the rear right seat door trim outlet through a duct,

a front left seat door trim opening communicating with the front left seat door trim outlet through a duct,  
and

a rear left seat door trim opening communicating with the rear left seat door trim outlet through a duct,  
and

an instrument panel door disposed to change an opening area of the instrument panel opening for controlling the volume of air to be introduced to the instrument panel outlet and the ceiling outlet,

a rear left seat air-distributing door rotatably supported at a position upstream of the rear left seat door trim opening and the rear left seat opening,

a rear right seat air-distributing door rotatably

supported at a position upstream of the rear right seat door trim opening and the rear right seat opening,

a front left seat door trim door disposed to open and close the front left seat door trim opening,

a front right seat door trim door disposed to open and close the front right seat door trim opening,

a front right seat air mix door for controlling the volume of air flowing through the front right seat opening by adjusting its opening rate, and

a front left seat air mix door for controlling the volume of air flowing through the front left seat opening by adjusting its opening rate.

11. The air conditioner according to claim 10, wherein the interior wall includes multi-layered structure forming three dimensional ventilation holes therein, thereby allowing the air to exude into the compartment.

12. The air conditioner according to claim 10, further comprising:

a first temperature control means for controlling the temperature of air to be blown into a left region of the compartment by adjusting the volume of cooled air cooled by the cooling heat exchanger and the volume of air to be heated by the heating heat exchanger, wherein the first temperature control means is located between the cooling heat exchanger and the heating heat exchanger in the first part of the case; and

a second temperature control means for controlling the

temperature of air to be blown into a right region of the compartment by adjusting the volume of cooled air cooled by the cooling heat exchanger and the volume of air to be heated by the heating heat exchanger, wherein the second temperature control means is located between the cooling heat exchanger and the heating heat exchanger in the second part of the case.

13. The air conditioner according to claim 12,

wherein the first temperature control means is constructed of a left air mix door and the second temperature control means is constructed of a right air mix door,

wherein the first part and the second part of the case are disposed such that heated air passage and cooled air passage are formed so that heated air, which is heated by the heating heat exchanger, flows toward the instrument panel opening and merges with the cooled air, which is cooled by the cooling heat exchanger, at a position proximate to the instrument panel opening.

14. The air conditioner according to claim 12, further comprising:

a third temperature control means for controlling the temperature of air flowing through the front left seat opening by adjusting the volume of cooled air cooled by the cooling heat exchanger and the volume of heated air heated by the heating heat exchanger in the first part of the case;

a fourth temperature control means for controlling the temperature of air flowing through the front right seat opening by adjusting the volume of cooled air, which is cooled by the cooling

heat exchanger, and the volume of heated air, which is heated by the heating heat exchanger, in the second part of the case.

15. The air conditioner according to claim 14,

wherein the third temperature control means is constructed of a front left seat air mix door rotatably supported at a position downstream of the heating heat exchanger in the first part of the case, and the fourth temperature control means is constructed of a front right seat air mix door rotatably supported at a position downstream of the heating heat exchanger in the second part of the case,

wherein the first part and the second part of the case are disposed such that the heated air flows toward the front left seat opening and the front right seat opening and merges with the cooled air positions proximate to the front left seat opening and the front right seat opening, respectively.

16. The air conditioner according to claim 14, further comprising:

a rear left blower including a centrifugal fan for introducing air to a rear left region of the compartment, wherein the rear left blower is located downstream of the heating heat exchanger and upstream of the rear left seat door trim opening and the rear left seat opening in the first part of the case; and

a rear right blower including a centrifugal fan for introducing air to a rear right region of the compartment, wherein the rear right blower is located downstream of the heating heat exchanger and upstream of the rear right seat door trim opening and the rear

right seat opening in the second part of the case.

17. The air conditioner according to claim 16, further comprising:  
a fifth temperature control means including

a rear left seat heated air mix door that is rotatably supported at a position upstream of the rear left seat blower for forming a heated air passage through which the heated air flows toward the rear left seat blower, and

a rear left seat cooled air mix door that is rotatably supported at a position upstream of the rear left seat blower for forming a cooled air passage through which the cooled air flows toward the rear left seat blower; and

a sixth temperature control means including

a rear right seat heated air mix door that is rotatably supported at a position upstream of the rear right seat blower for forming a heated air passage through which the heated air flows toward the rear right seat blower, and

a rear right seat cooled air mix door that is rotatably supported at a position upstream of the rear right seat blower for forming a cooled air passage through which the cooled air flows toward the rear right seat blower,

wherein the first part and the second part of the case are disposed such that the heated air merges with the cooled air at air intake ports of the rear left seat blower and the rear right seat blower, respectively.